Industrial FINISHING

Reg. U. S. Pat. Off.

Devoted to Product Finishing in the Factory

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Letters from Readers of "Industrial Finishing"

The names and addresses of firms or individuals whose letters and inquiries appear in this department may be had by writing this office, or letters addressed to them in care of this office will be forwarded promptly.—The Editor.

Dipping Machine

We would like to have the name of a manufacturer of paint-dipping machines for air-dried articles, to be used for dipping various lengths up to about 8-in.—D. L. F. (Toys, Games and Novelties).

Graining Plates

Do you know who makes printing plates that can be used for obtaining an imitation mahogany or Circassian walnut on metal?—M. W. S. (Varnish, Lacquer Mfr.).

Inspection Lamp Wanted

We are interested in learning where we can purchase a drum inspection lamp, such as that shown in February, 1935 issue, page 30.—S. P. T. Co. (Paint Products).

Metal Cleaner

We manufacture metal displays, which are fabricated of tin plate. This is soldered together. We then have to spray with lacquer and we want to be sure that it will spread and come out clean and uniform, so we have to wash or treat these displays to take the grease off the tin as well as the acid marks on same. What can these displays be washed with? Is there any solution in which these can be dipped to free them of the grease and the acid from solder? We want the simplest and cheapest methods, and also the names of the concerns that manufacture the products for cleaning purposes.—G. C. F. Co. (Counter Display Cases).

Roller Coating Machine

We are interested in securing information about the roller coating machine, as mentioned in March, 1935, issue of INDUSTRIAL FINISHING, page 6, and signed "G. H. Co." (Toy Blocks).—A. B. Co. (Awnings, Tents, Truck Covers).

Silk Screen Work

We would like to obtain detailed information about a method known as "Silk Screen," used for printing designs on paper, etc.; also, if possible, a price on an automatic silk screen machine.—S. C. F. Co. (Spark Plugs).

Wood Grained Steel Sheets Wanted

One of our members advises that they could use to advantage steel sheets that have been grained to resemble natural wood. Do you know of any firm specializing in this work, and if so, whether or not the sheets are carried in stock?—National Association of Purchasing Agents.

Porcelain Cement

We notice in your January, 1935, issue of INDUSTRIAL FINISHING, on page 33, an item about porcelain cement for repairing porcelain enamel finishes. Will you please arrange for the manufacturers to send us full

GLOWOOD »

A New
Furniture Finish

SOFT, PLEASING AND APPEALING

PASTEL SHADES

ENAMEL COLORFULNESS
VISIBILITY OF GRAIN

Especially Adaptable to

BEDROOM — DINETTE
OCCASIONAL — NOVELTY

Furniture

Acclaimed by Representative Manufacturers As

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STANDARD SHADES — YELLOW, GREEN, ORCHID, BLUE, OLD ROSE

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National Headquarters — Cleveland, Ohio

particulars, and a sample of this particular product, together with the name and address of an English Agent?—The Gramophone Co., Hayes, Middlesex, ENGLAND.

In the shipment of our porcelain breakfast tops, the edges occasionally are damaged. In the past we have used a porcelain glaze to fill in the chipped parts, after which we touched up the places with paint. The only trouble with this cement is that it is too thin to fill in the chipped places property, and if applied thick it has a tendency of not hardening. Therefore, I appeal to you if you know of any putty or cement on the market that will adhere to bare metal. Also inform me where to purchase this cement.—P. J. K.

We understand that you are manufacturing porcelain cement, and on reading your ad. in the INDUSTRIAL FINISHING magazine, believe that your material in black and also in white would be a desirable item for us to have. Please send us particulars about this material.—R. E. D. (Electric Refrigerators).

Flexible Rubber Lacquer

We are interested in the "Flexible Rubber Lacquer," described on page 24 of the January issue of your magazine. We shall be obliged if you will also let us have the manufacturer's name and address, or if you will inform them that we are interested in their product and would like them to communicate with us.—Macondray & Co., Inc., Manila, P. I.

Pearl Essence

Can you supply us with any information relative to concerns supplying Pearl Essence finish for wood poker chips? Any information pertaining to manufacturers and sources of supply for this Pearl Essence will be greatly appreciated. — W. P. Co. (Poker Chips; Golf Tees, Etc.).

Cedar Oil Damage

We manufacture cedar chests in the 2-ply, that is a veneer face on ¾-in. cedar, which is the method commonly used in the United States. We find, however, that the oil in the cedar knots, particularly, penetrates the veneer, causing a roughness in the varnish after the chest has been in use for several years.

The cedar core is dried to a moisture content of from 6½% to 7%, and the outside of the chest is finished in the usual manner, with stain, filler, shellac and varnish. We would be very much pleased to know if there is a method of finishing that would prevent the oil in the cedar from penetrating.—H. T. F. Co. (Cedar & Walnut Chests).

Heat-Resisting Finish

We are making small electric furnaces, and the finishing materials we use do not hold their gloss as well as we would like. These furnaces are finished in an olive green, similar in color to office furniture, sprayed on and air dried. The drying time is not important if will fully harden over night. The furnace jacket runs about 250°F., and it looks as though this is not a high temperature from the finish point of view, and we should not be troubled with gloss killing. If you can suggest a material that is likely to be good for this purpose, we will appreciate your doing so.—S. D. R. (electrical apparatus).

To Clean Castings

On page 28, of the November, 1934, issue of your magazine, there is an article titled "Finishing Lawn Mowers," which was written by Mr. J. E. Greene. Since we manufacture lawn mowers we are interested in the finishing and also in the method of cleaning and would appreciate advices from you or from Mr. Greene as to the best method of removing grease and other foreign matter from the castings before painting. Any information which you can give us will be very much appreciated.—T. Mfg. Co.

Coloring Pressed Steel Parts

In the plant at which I am now engaged, they make a considerable volume of trunk corners, handle loops, catches, etc., using steel coil stock in thicknesses ranging from somewhere about .020 to .035-in., and this material is processed through a piercing and blanking operation, followed by a forming operation.

Under the present practice these punch press operations are followed by a rolling operation in order to remove the oil and grease, and in some cases to remove the burrs which are left on the punched edges. The final

(Continued on page 54)

ADVERTISING PAGES REMOVED

Synthetic Resin Finishes

by Dr. Wilhelm Krumbhaar
Vice President in Charge of
Technical Development,
Beck, Koller & Co., Inc.

Editor's Note: A man came into our office the other day seeking information about synthetic resin finishes. He is Assistant General Manager of Sales in the Sheet and Tin Plate Department of a nationally known steel company. His company roller coats sheet metal with a synthetic finish, bakes the finish and supplies this roller-coated sheet stock to fabricators—factories making pressed-metal products. He wants to know more about these synthetic finishes so he will have a more intimate and thorough knowledge of what he is selling.

Many others are asking all kinds of questions about synthetic finishes. Accordingly we assembled a list of representative questions and put them up to an authority on the subject. Dr. Krumbhaar, at our request, has prepared this timely article especially to meet the specifications and requirements of readers of Industrial Finishing magazine.

YEARS AGO industrial finishes were made on the base of copal and linseed oil. These were followed by the well known combinations of phenolic resins and wood oil which, in turn, were replaced to a large extent by nitrocellulose lacquers of various types. Development of industrial finishes is always progressing, and within the last five years has led to a new type of industrial coatings, the so-called synthetic resin finishes, which are made on the base of the alkyd type resins.

Alkyd resins are resinous substances which are made by chemical reaction between phthalic anhydride [thal-ik an-hi'drid], an organic acid produced from naphthalene, and the well known glycerine. Other important ingredients are combined with these two substances, that is to say, fatty and resinous acids of various types, and in many cases also phenol formaldehyde products. From these remarks it can be seen that a great variety of alkyd resins is possible, resulting in a great number of different synthetic finishes.

Three Groups of Synthetic Resins

In order to give a more concrete idea of the possibilities of variations, a few of the more im-

portant groups of these resins should be mentioned.

The first group contains the straight alkyd resins made simply by phthalic anhydride, glycerine and fatty acids, which can again be subdivided into non-drying, semi-drying and drying types. The composition of these resins can also be varied by changing the amount of oil used.

A second group comprises all those types which are phenol modified and which may contain different types of phenols resulting in a variety of finishing materials.

In the third group are assembled together those resins which are modified by other resinous substances, as for instance, natural resins, which again produce coating materials of very pronounced properties.

It is helpful for the user of industrial finishes to have an idea of the properties of the different types of resins and the characteristics they impart to coating materials.

Straight Alkyd Resins

The straight alkyd resins are characterized by an extreme durability, especially if they are baked. Those resins made on the base of non-drying fatty acids, of course, are designed to be used as additions for nitrocellulose lacquers, and cannot be used alone for making finishes. Those resins containing semi-drying oil, however, can be applied by themselves if dried at higher temperatures, and are an ideal base for baking finishes. The alkyd resins on the base of drying oils will dry excellently at ordinary temperature and when baked in the oven. The drying time depends upon the oil content, and in air drying it varies between two and six hours, while in baking at about 200°F. it varies between 30 minutes and one to two hours.

All these straight alkyd resins give very flexible finishes for all kinds of industrial uses. They also produce very flexible undercoats with especially good adhesion to metal surfaces.

Phenol Modified Resins

The phenol modified type resins give finishes which set quickly, even when air dried, and which bake hard at low temperatures. They are ideal for the formulating of quick set, oil resisting, air drying enamels, for the making of enamels baking quickly at low temperatures and for the production of undercoats where hardness and adhesion are of paramount importance.

In case a longer drying time is permissible, phenol modified resins are used with a higher amount of wood oil which is a very water resistant oil. These long-oil phenol-modified alkyd resins are ideal for formulating air drying, waterproof, industrial enamels for machinery finishes of all types, and also for metal primer. In combination with nitrocellulose they also produce print-proof clear lacquers and high gloss lacquer enamels. In such cases they provide waterproofness and alcohol resistance.

Alkyd Resins Modified by Special Natural Resins

Finally, the characteristics of those alkyd resins must be mentioned which are modified by special natural resins. They yield finishes for tin decorating purposes and other metal work of

outstanding pale color and unusually good color retention.

A classification, such as the grouping just described, gives a general idea of the different types of alkyd resins which are on the market today, and which are actually used as a base for industrial finishes. They are known under different trade names, and are usually handled, not as the resins themselves, but in the form of solutions. Besides their trade names they are generally referred to as either synthetics, plastics or phthalics.

Thinners for Synthetic Finishes

For the users of synthetic resin finishes, the question of the right thinner is of paramount importance. In most cases, the materials have to be thinned down to a certain viscosity, particularly if they are applied by the spray gun. However, it is impossible to give a set rule for the thinner best suited for these purposes. Some synthetic resins are compatible with mineral spirits but the majority of the plastic resins have a limited tolerance for mineral spirits and have to be thinned down with coal-tar solvents such as toluol, xylol or solvent naphtha. In many cases, the hydrogenated products of the Solvesso type are also suitable. Every synthetic finishing material has a different behavior. In using thinners or reducers, therefore, it is best to follow the suggestions of the manufacturer of the coating materials. In order to demonstrate the enormous influence of the solvent nature on consistency, one need only compare the consistency of a synthetic enamel thinned down with mineral spirits against one thinned in the same manner with toluol.

Can be Applied Any Way

All synthetic finishes can be readily applied by spraying, dipping, tumbling, roller coating and flow coating. Application by brushing, however, is limited to certain types and in using synthetic finishes it should always be borne in mind that only the long-oil types of alkyd resins have perfect brushability. Of course, if smaller surfaces are to be brushed, as for instance in the case of mechanical striping, the short-oil types of alkyd resin are also suitable.

Can be Made to Meet Various Requirements

From the classification given before, it can be easily seen that there is an enormous possibility for the formulator of industrial finishes to suit the different purposes. A large variety of resins are available with very pronounced properties, enabling the formulator to fill practically any requirement in the industry. Experience has shown that by means of alkyd resins of the types described, it is possible to make finishes which have unusual resistance against alcohol, water, heat, acid solutions, alkali, scratches, exposure to weather, etc.

The resistance and durability of all synthetic finishes depends largely upon the method of drying—whether air dried or baked. This holds true for the clear finishes as well as for the colored enamels. There is also another factor which has a bearing on the resistance and durability of these finishes, and that is whether they are applied on wood, metal, fabric or on other materials. As a rule, the resistance, especially the water resistance, is higher when the finishes are baked than when

they are simply air dried. Baking temperatures may vary at times from a few minutes to a few hours and from 150° to 350°F. and more. In order to give a general idea it might be well to mention that the automobile finishes, as a rule, require about one hour at 225°F., and the refrigerator finishes require 1½ hours at 250°F.

Merits of Synthetic Finishes

Synthetic finishes have pronounced merits compared with those of nitrocellulose lacquers, oil enamels, oil paints and natural gum varnishes, for the simple reason that the properties can be adapted much easier and much more completely to the particular requirements of the user. In addition to this, they have characteristics which no other type of finish possesses. As a matter of fact, synthetic finishes combine at the same time quick drying, tack-free surface and utmost durability. The point of durability is being stressed more and more, and everybody is going to realize more each day that the highest degree of durability, together with the other desirable properties, can only be obtained through the use of synthetics.

Taking into account the special merits of synthetic finishes, the prices compare very favorably with those of nitrocellulose lacquers, oleo-resinous paints and enamels, and natural-gum varnishes. Basing figures on the performance of the material, they may be even cheaper and, in addition to this, it can be considered as a decided advantage that as the industrial development stands today, the particular chemicals necessary for the production of synthetics are always available in sufficient quantity and in uniform quality. Therefore, the user of industrial finishes need not be afraid of being hampered by a possible shortage in these chemicals.

The volume of business in synthetic resin finishes has increased during the last five years enormously. Roughly speaking, the volume has doubled each year, and it is very probable that the same development will continue, inasmuch as the use of synthetic finishes is spreading more and more, and new applications are always being found.

Where Synthetic Finishes are Used

The increase in volume is mostly due to this developing of new uses and, therefore, does not mean a corresponding decrease in the sales of other types of finishing materials. The territory of nitrocellulose lacquers has been penetrated to a certain extent, by this development. A considerable quantity of alkyd finishes for instance are now used in the furniture industry. Another field will open for alkyd resins, at the expense of lacquers, through the development of the modern system of painting automobiles. This system consists in putting on two double coats of primer surfacer and two double coats of synthetic enamels, both of which are made on the base of synthetic resins.

Another field gained by the alkyds at the expense of other coating materials is the high baking white refrigerator enamel. Most of these high bake enamels contain semi-drying types of alkyds, and their baking schedule is higher than that of the oxidizing ordi-

nary alkyd type consisting of bakes between one or two hours at 250° to 300°F. for both the primer and finish.

Of course, it is impossible to mention all the new uses of synthetic resins which are constantly bobbing up in the field of industrial finishes, but experience shows that they can actually be used, at least as an addition, in any type of industrial finish.

Certainly, the largest use of synthetic resins is for automobiles, railroad cars, trucks, street cars, etc. Another big outlet for synthetics is for refrigerators, washing machines, and other household and industrial machinery. Large quantities are also used for store and office fixtures, tin decorating purposes, toy enamels, leather, linoleum and paper coatings, and one of the largest consumptions of these resins is in the furniture and radio industry.

As mentioned before, the use of synthetics is extending more and more, and in addition to its already well established uses, new ways and purposes of application are constantly being developed, and it is a positive fact that we will very soon reach the point where coating material, whether architectural or industrial, whether air drying or baking, will contain at least a certain amount of synthetic resin.

Becomes Advertising Manager for McDougall-Butler Co.

George I. Petroe, who for more than a decade has designed most of the display material used by McDougall-Butler Co., paint, varnish and enamel manufacturers of Buffalo, N. Y., has been appointed to the post of Advertising Manager by that firm. In the capacity of Art Director and Production Manager for one of largest manufacturers of "Point of Sale" advertising material—he served manufacturers in that area for over 13 years. This new connection affords Mr. Petroe an opportunity to apply to the paint, varnish and enamel industry, a broad knowledge of advertising and merchandising problems, gained in contact with many establishments in the eastern and middle states.

Anderson-Prichard Appoints Manager at Akron

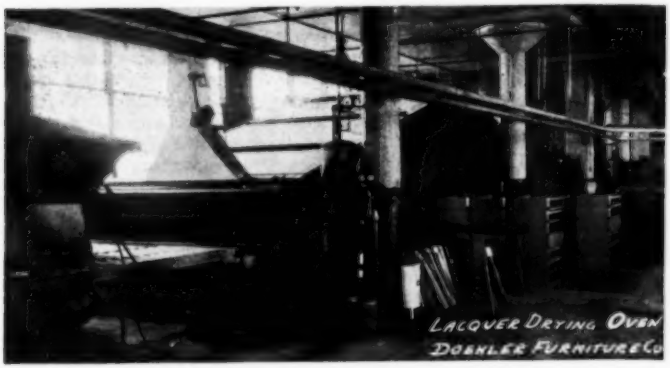
The Anderson-Prichard Oil Corp., Oklahoma City, Okla., announces the appointment of Mr. Homer Easterday as Eastern Division manager at Akron, Ohio, replacing Bruce C. Dodd, resigned. Mr. John Licata has been appointed sales manager.

John Licata was the first salesman for Anderson-Prichard in the Ohio district and has many friends in the various industries in Ohio.

Both will make their headquarters in Akron.

25th ANNIVERSARY

A quarter of a century of development and practical experience is in back of the Puritan line of Bronze Powders. The Puritan line includes Silver Paste, Aluminum and Gold Bronze Powder finishes in over 100 colors, Varnish Bronzing Liquids and Bronzing Lacquers. Samples sent on request with Technical Information. Otto A. Both Corporation, 50 Hartford St., Boston, Mass. —Adv.



» » Air-Conditioned Finishing Rooms—III

This is the third installment of a series of articles prepared from practical men's answers to the Editor's questionnaire about the possible value of, or need for, air-conditioned finishing rooms in industrial establishments.

IN TWO previously published articles, which appeared under the above title in INDUSTRIAL FINISHING, four timely and practical questions about air-conditioned finishing rooms were taken up, discussed and commented upon by several men who are thoroughly conversant with modern finishing methods, materials, equipment and the conditions prevailing in typical industrial establishments. The men who answered the Editor's questionnaire include experienced, well-informed foremen finishers, factory superintendents and manufacturers' representatives who visit finishing departments to sell goods or make demonstrations therein. A fairly complete cross section of industries and territory in the U. S. is represented by the replies which have furnished data for these articles.

The desirability of having air-conditioned finishing rooms is practically unanimous; however, the replies, discussions, recommendations, suggestions and comments of various practical men in reference to this important subject are both interesting and enlightening, and this original data is going to furnish some very use-

ful information for the future guidance of both the suppliers and users of industrial air-conditioning equipment.

Air-conditioning is already widely recognized and well established where it serves in the capacity of a near luxury by providing greater comfort for the patrons of up-to-the-minute theaters, department stores, restaurants and railways coaches. However, several successful installations in outstanding industrial plants reveal it as occupying the role of a practical necessity also, because it puts production process schedules on a more rapid, more accurate and more dependable basis every day throughout the year, with absolutely no interference from or dependence upon outside weather conditions.

Resuming the discussion of questions, we now take up:

No. 5—Have you any idea as to what all would be needed for a good air-conditioning outfit? If so, suppose you write a few remarks on this.

A) The ideal set-up is washed air for cleanliness; perfect heat control; proper ventilation, preferably by motor driven fans; walls and floors that are easily cleaned; a light, dust-tight room with insulated walls and ceiling. It is usually advisable to have the finishing room on the top floor of the building so that there will be no possibility of tools or other articles dropping on a floor above and knocking dirt down on freshly finished work.

B) In my opinion there is nothing that will give the equal or desired results better than conditioning the entire finishing room, thus making it *a drying finish room*. By this I mean provision in radiation for raising the temperature to about 100°F. every night during the year, and providing adequate means for furnishing a constant circulation of fresh air, which can be done with proper ventilators and one or more fans. Such an arrangement is both practical and economical in very nearly all finishing departments. I suggest placing the heating coils or hot air pipes along the outside walls underneath the windows, and having the ventilators take air from the center of the room and extend down to within a few inches of the floor. Hot blast pipes or heating coils should not be near the top or the center of the room, as such a location of the heating system will prevent good circulation and will increase the expense of heating. The heat should be turned off about three or four o'clock in the morning to allow the room and work to cool off, and the finishing materials to harden before the men commence work for the day.

C) Fans, blowers, unit heaters, vapor control apparatus, thermometers, barometers.

D) It depends on the size of the finishing room, which would require electric fans to remove all fumes that evaporate from wet finishes. The same would apply to heat and ventilation . . . whereby no dust, soot, smoke, or insects could accumulate, as such things spoil many a finish. Floors should be made of hardwood or some composition material, and they should be oiled once a week with a slow-evaporating oil such as paraffin or castor oil. Any oil that is slow in evaporation can be used.

E) The equipment necessary

for proper air-conditioning would require the services of an engineer trained in this work. The desired results would call for equipment that would maintain a predetermined temperature and humidity—this in all parts of the rooms by well directed currents of air . . . preferably overhead so as not to interfere with floor space. Properly built and equipped spray booths. Properly washed, temperature-and-humidity-controlled air drawn in from the outside and so directed as not to strike any one area with heavy blasts. All equipment should have automatic controls which could be hand controlled if necessary.

F) Almost every finishing room has its particular problems, depending upon the kind and variety of goods finished. The finishing room of a casket factory would possibly require a different treatment than that of an automotive or toy establishment. My strongest imagination of this would be a day drying room, off from the main finishing and spraying room, with a thermostat to adjust the temperature automatically—where a circulation of clean, fresh, warm air could be admitted at will during the day —and with the finishing room having an outward floor exhaust. Also sufficient radiation and humidity control for the entire finishing room, so the temperature could be raised to a height at night for drying all pieces in work the whole year round. This problem, of course, should be referred to air-conditioning engineers for the correct solution. While methods and details may differ, the principle of application and control would remain the same.

G) Changes in spray room dimensions, air intakes, fans, heaters. For cooling equipment, the cost would be prohibitive in a small plant.

H) Ventilators, air-washing machines, circulation fans, all of which can be figured out by those companies who specialize in this apparatus.

I) For the good air-conditioned outfits we would need equipment like those used in the modern theaters and hotels. It would depend upon the size of the finishing room how many cubic feet would have to be air conditioned. In some of the finishing rooms I know of, the ceilings are 20-ft. high. Finishing rooms with high ceilings will require a special air-condition unit. I do believe that in the near future there will be a large development of air-conditioned finishing rooms because they (executives of manufacturing firms) will see the advantage it gives in turning out dependable, high-quality work economically and always on schedule time.

J) Steam heat . . . ventilating fans that do not blow strong drafts directly into the room . . . proper place for elimination of bad air.

K) First of all, the air should be filtered to free it of solid particles. Second, when the air is too damp, there should be means for bringing the humidity down to a more favorable ratio. Third, to boost the humidity when the air is naturally too dry.

L) The things needed for complete conditioning would be: 1) A refrigerator unit for cooling and dehumidifying; 2) an air scrubber; 3) suitable insulating materials for walls, ceilings and floors, for example, pressed wood, Masonite, etc.; 4) blowers; 5)

more glass in outside walls will aid not only in preventing heat losses by radiation and moisture intrusion, but will improve working conditions; 6) the use of white paints of the new, moisture-proof, non-yellowing synthetic type will aid very substantially in the reduction of dehumidifying costs, according to experience of competent engineers.

(To be Continued)

Notes on Staining

WHEN a decided change in the color of softwood is wanted, oil stain may be used to advantage, but in the case of close grained hardwoods, water or spirit stain should be used.

If stain curls the hair of a brush even a trifle, it is best to discard the brush; otherwise an uneven finish will result.

Spirit and oil stains do not raise the wood grain to any marked degree, therefore sandpapering afterward is unnecessary.

Staining is best done when the surface being stained is in a level position, because then the stain will not run or show streaks.

Alcohol stains fade readily, therefore when an alcohol stain is used the stained piece should be placed in a dark, well-ventilated place for drying. Permanency of these stains depends entirely upon a following coat of shellac. In a lesser degree this is also true of oil stains.

A mahogany water stain, after drying, should never be sanded directly on the stained surface; it should be brushed with a stiff brush. Then apply a wash coat of shellac and, when dry, sand lightly with fine sandpaper. This prevents the trouble often caused by sandpapering through the stain in spots, which results in white edges.

Most stains are applied cold, but in some cases they should be warmed to penetrate the wood better. When the pores of the wood are large and coarse, a stiff brush should be employed, because the pores are filled with air cells and do not take the stain well unless a stiff brush is used.

Staining shows the structure of the wood in its natural beauty and for this reason transparent pigments are desirable in the making of stains. The grain of the wood should not be clouded. Deep staining is usually preferable, because later if the surface is scuffed it will not show the bare wood.

Proper application of stain requires a certain amount of skill and practice. It must be put on evenly and not show laps, streaks or runs; also it must be put on heavily enough to penetrate the wood. On close fibered woods,

where the stain penetrates with difficulty, it is sometimes better to apply two coats of stain to obtain the proper depth of color.

Before staining resinous wood, the surface should be prepared by sponging it with an alkali solution (4-oz. of sal soda to one gallon of water) to which should be added 1-oz. of ordinary washing soda to avoid discoloring. After sponging with this solution, allow the surface to dry; then sponge again with warm water. This sponging will make the wood susceptible to the ordinary water stain.—C. F. SCRIBNER.

Finishing Room Personnel

OF ALL departments in the factory the finishing room is the one place where both the foreman and workmen should cultivate harmony.* The slightest friction is bound to show up unprofitably for the company—not only in the quality of the finished product but in the quantity of production as well. The character of trained workmen can always be seen in the finished product. High class finishing cannot be obtained from a man or group of men of disturbed disposition. Men in a bad frame of mind will upset the entire finishing room staff and cause needless expense to the plant.

The foreman who uses high grade finishing materials does not get the results that he has a right to expect because of the lack of cooperation on the part of some workmen. Expensive finishing materials are not entirely foolproof, and unless close inspection is given to the workmen they are liable to upset production, which generally happens at an important time.

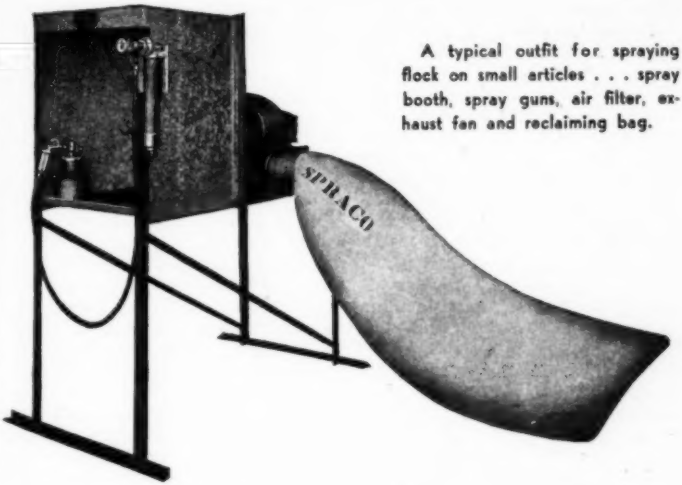
The manufacturer of finishing materials hesitates offhand to make good any complaints against his products when he knows the possible unreliability of some of the men who claim to be experienced finishers. Reliable manufacturers of finishing materials are always ready to stand back of their goods when they have confidence in the character of the men intrusted with the use of their products. It is my opinion that the worthwhile trained workmen are those who take advantage of their opportunities, discussing problems and pooling their thoughts and experiences with others of their craft—men who are constantly seeking more knowledge pertaining to their particular work. Such workmen are usually steady, dependable employes.—J. E. GREENE.

*The slogan in a famous piano factory is: "If there is no harmony in the factory, there can be none in the instrument."

Book on Air Conditioning

Just off the press is a new 20-page book on Kelvinator Air Conditioning, containing full information for architects, engineers, contractors, manufacturers, merchants and home owners. This book, one of the few available on this subject, answers the question "What is air conditioning and how does it work?" analyzing air conditioning as an outstanding human need and tracing Kelvinator's contribution to the fulfillment of this need.

The book is attractively designed and contains a great number of illustrations and plan drawings showing practical applications. It also stresses the importance and value of the principle of Exact Selection, Kelvinator's unique method of meeting individual requirements with exactly the right equipment. The new book is available through the Kelvinator Corporation, Air Conditioning Division, Detroit, Mich.



A typical outfit for spraying flock on small articles . . . spray booth, spray guns, air filter, exhaust fan and reclaiming bag.

Applying Flock Finish

by M. G. Kopf
Consulting Industrial Engineer

AMONG the numerous novel finishes introduced during the past few years none has elicited more interest than the one known as "sprayed cloth" or imitation suede. This finish has not only proved attractive but likewise useful as a sound-deadener, a means to prevent moisture condensation and rust marks, to afford a "warm feel" over metals likely to contact the body, a cushion for drawer bottoms, table tops, etc. (to facilitate handling objects like cards or coins) and on handles for securing a firm, sweatless grip.

While the application of "powdered cloth," commercially known as "flock," to surfaces has been known for 25 years or more (and more recently its application to paper on a large scale) it is only lately that it has been generally introduced to the trade. This broad use has been made possible by the design of air spray apparatus to handle the flock efficiently. Previously, and even now in some cases, the flock was sifted or dusted onto the prepared surface—letting it fall into place by gravity. Improvements in the character of the flock and the liquid adhesive or prime coating used with it, along with the production of wool and rayon as well as cotton, have added to the possible applications as both a deco-

rative finish and useful surface.

Two of the earlest applications, described to the writer, were for the carved surfaces of wood burial caskets and for display signs. The method was to brush a slow-drying varnish over the surface (kept level) and, while wet, to sift over it the cotton lint available in those days. Today a similar method is employed by special machines for the quantity production of flock-coated paper, etc., using various quick-dry prime coatings, depending on the application of the product. A choice of prime coatings makes it possible to use other suitable materials like sand, powdered wood and cork, broken sea shells, etc., thus producing a great variety of novel effects and useful surface coverings. Emery and sandpaper might be broadly included in this class of useful coverings.

Among the many loading materials used in rubber, fiber and Bakelite molded products, cotton lint is especially popular. It gives strength without adding much weight. With the tremendous increase in molded products came improvements in the lint flock. It is now possible to purchase cotton, rayon and wool flock in different lengths, grades and colors to best suit the purpose desired.

Naturally, manufacturers of flock sought new outlets for their products. The possibility of spraying flock over suitable coatings on metal, glass, composition material, wood, paper and cloth, regardless of the shape or position of the surface, suggested a wide field. Years of experience in spray gun development and production, along with similar experience in coating manufacture, led to the present simple method of applying flock to most anything. Several manufacturers supply guns and other equipment especially designed for spraying flock, and there are likewise a number of manufacturers of flock and liquid coatings.

Some experience is necessary in using the gun and materials. In the preparation of wood, composition board and similar porous materials for flock coating, an inexpensive sealer must first be used. Usually a shellac, "lacquer bronze" coating, quick-dry varnish or glue sizing is employed, depending upon the prime coating to follow. If a lacquer coating is to be employed as an adhesive for the flock, the sealer must be impervious to it. Generally speaking, lacquer prime coats are not satisfactory for large surfaces or quantity production because they dry so rapidly. Whatever the choice, the surface over which the flock prime coating is applied must be impervious; otherwise the flock will not adhere uniformly.

The Adhesive, Size or Prime Coat

The prime coating is sprayed in the usual manner, the operator spraying on a uniform wet coating that comes just short of sagging on vertical surfaces. On small surfaces the work may be dipped or brushed. All sharp edges should be rounded or broken as much as possible, and these edges should be sprayed first; then spray them again when the other surfaces are coated. Sprayed coatings tend to run thin on edges or corners and by spraying these edges first, and then the remainder of the surface, sufficient time elapses to permit the first spraying to partially set, producing on the second pass a heavier film. By observing this precaution the

flock coating will adhere evenly, and as thickly on edges as over the larger surfaces.

The use of a "round spray" is advised on all edges, as well as on all cylindrical and spherical surfaces unless such areas are 12-in. or more in radius. If cylindrical work (like a waste basket) can be rotated while being sprayed, the flat "fan-like" spray may be used, but it should be directed at right angles to the axis of the basket.

Oil-base or synthetic-base prime coats are formulated to remain wet for at least ten minutes, up to which time the flock may be sprayed or sifted over it — provided a full and even prime coat has been applied. On large work, like burial caskets, it may be necessary to second-pass part of the surface with prime-coat thinner in order to secure uniform wetness. To avoid this a second operator to spray the flock, following the first in due time, is helpful as a means of preventing rejections. There should be no doubt about the wetness of the prime coat if satisfactory work is desired and if shiny spots are to be avoided.

There is more danger from having too little prime coating than too much. In the event that certain flock-sprayed areas show the prime coat seeping through, it is possible to spray over this with more flock and avoid rejection. Every job should be carefully figured as how best to spray it, so as to avoid spraying the prime coat after part of the work has received the flock. Often the overspray from the priming material ruins the flock coating previously applied, unless such flock coating is protected with shields. It is best to work out a plan to spray all of the work at one time with the prime coat. It is very difficult if not impossible to join two flock areas (sprayed at different times) without showing a lap.

Preparing Flock for Spraying

Before placing flock in the cup or container that supplies the spray gun it is well to loosen it up in sufficient quantity for a

A spray gun with attached container—designed especially for spraying flock.

day's work. An ordinary flour sieve is suitable for this purpose, although for quantity production large motor-agitated sieves are used. If a mixed flock is desired it is well to do the mixing at this time—through the sieve. Do not dry the flock before or after mixing. Unless it contains its natural moisture content it may become electrified and lump badly in the container or gun. Even dry air has been known to cause trouble in spraying flock. It is well to ground the metal cap of the spray gun to the nearest water pipe or gas line, to prevent lumps forming and blocking the gun. (This is recommended when using certain makes of spray guns.)

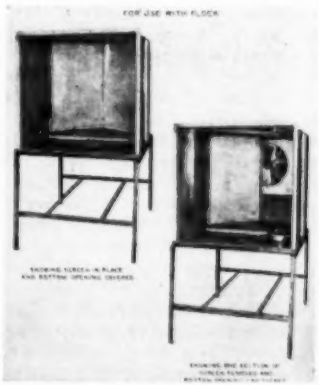
After sifting the flock, use a

scoop and funnel to fill the spray cup. Avoid compressing any of the flock. Transferring flock by the handful to the cup, tends to pack it and often causes the gun to become blocked. The sifted flock should be kept in a large tray to a depth of several inches, and not piled up. After several hours a pile of a few pounds can easily pack and will need resifting. Never fill the gun cup more than three-fourths full, as more than this may pack in a mass and become clogged in the spray gun. When spraying, keep the gun in upright position as much as possible especially when it is more than one-fourth full. Turning the cup obliquely, or on its side, is sure to cause lumping and stoppage of the nozzle opening.

Adjusting the Flock Spray Gun

In adjusting the spray gun I have found the following procedure best: Start with the cup half full of flock. All controls should be closed. Adjust air line regulator to 30-lbs. pressure. Open up valve to agitator slowly until a misty dust is emitted from the nozzle. There should be little or no force to the mist, but rather a floating of the flock from the nozzle. Turn on the center nozzle valve until a solid and continuous stream of flock is seen. It may be necessary at this point to open up the agitator valve slightly more. To secure a fan-shaped spray, open up proper valve just sufficiently to produce results, but no more. Finally, check the air pressure while the gun is open and hold it at 30-lbs. Rayon, used alone, requires somewhat higher pressure than cotton. Make certain that the agitator tube is in center of cup.

Excessive air pressure and too much flock on the surface being sprayed, are to be avoided, not only in the interest of economy but in order to prevent imperfect work. Too much air hardens the primer, especially on edges or narrow surfaces, and prevents the flock from adhering uniformly to the soft prime coat. Too much flock sprayed on the work, either through faulty spraying or by using an improperly-adjusted gun, will not produce the desirable raised nap effect. Moreover, excess flock comes loose in time, disfiguring an otherwise perfect job.



Two views of a flock spray booth which is available in several sizes. Removable cheesecloth screens intercept the over-sprayed flock.

Reclaiming Over-sprayed Flock

Special booths have been designed for trapping the over-spray of flock and thereby recovering it for re-use. By decreasing the velocity of the exhaust fan on the average booth, and placing a muslin-covered frame over the exhaust, or by covering the entire rear of the booth, the ordinary booth can be made to reclaim flock. A very

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effective scheme is to build a flock booth, where possible, on or adjoining one side wall of the booth in which the prime coat is applied. An opening cut in this side wall, well in the rear and on the same level as the fan, will create a low-velocity draft sufficiently strong to draw the flock to the rear. A muslin screen over the opening will trap the flock. Of course, the reclaimed flock should be sifted again as originally.

Sifting; Spraying

The use of face masks is no more necessary than for spraying other materials, providing a suitable booth and sufficient exhaust draft are used. In quantity production, some mechanical means should be provided for sifting; otherwise the flock must be sifted in the flock booth, or a mask provided if it is sifted in the open. The latter is wasteful and, even in smaller quantities, it should be avoided.

The great advantage of spraying flock, as compared to the original sifting method, lies in the splendid cloth-like nap that is produced. Each little thread leaves the gun parallel to the air stream and strikes the soft adhesive primer at right angles and embeds itself therein, end to. When sifted, the threads fall sideways and become embedded in all directions on the primer, giving a matted effect. To obtain the desirable nap effect, the spray operator should keep the gun at right angles to the work as much as possible.

Narrow edges, corners and such parts should be sprayed first, and with the round spray. This is important in order to secure a full nappy finish on these sections, and to conserve flock. For inside corners of boxes and the like, use the round spray again. On the larger plain surfaces, spray from the bottom upward. This will prevent the overspray from falling over the primer and interfering with softness of the final finish.

The foregoing directions for the application of flock may sound too detailed. Many months of actual contact in initiating the introduction of this finish and overcoming various troubles have proved to the writer that it is unwise and unsafe to take for granted any previous knowledge of spraying or finishing as a basis for success in applying flock. Most trouble is due to lack of thought and to the use of methods associated with plain finishing.

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The Uniforming of Different Woods

by G. H. Robertson
Sales Manager, Furniture Division
The Sherwin-Williams Co.

IN THE VERY competitive fields of radio cabinet making and manufacturing of less expensive furniture, it is impossible to use costly veneers throughout the entire piece. The problem, therefore, arises as to how the manufacturer can substitute other cheaper woods, and finish them to look like the more expensive veneers. It becomes purely a matter of finishing—and there are several ways in which this can be accomplished. The deciding factors are:

1) The kinds of woods used—their color, hardness, texture, etc.

2) The quality of finish desired. This is largely a matter of the amount of money that can be spent in uniforming the different woods. Five practical methods that are in daily use at various furniture plants are listed below. The cheapest of these is Method II. While this method uniforms the woods satisfactorily, it often gives a muddy finish. A clearer, more transparent finish is obtained from Methods I, III, IV and V, at only a slightly increased cost. As typical, combinations of birch, gumwood and walnut or mahogany are considered.

Method I

1) Spray quick-drying stain over entire cabinet, spraying heaviest on the light woods (birch) and spraying little or none on the darker woods (walnut). Dry 30 minutes to one hour.

2) Fill entire cabinet with quick-drying filler. Dry two hours.

3) Spray sanding-sealer over entire cabinet.

4) Highlight and even up the uniforming of the woods, where necessary, with shading lacquer.

5) Spray finish coats.

Method II

1) Brush (or spray) pigment wiping stain on birch and gumwood.

2) Brush quick-drying filler on walnut or mahogany. Wipe pigment wiping stain and filler. Dry two hours.

3) Spray sanding sealer.

4) Sand.

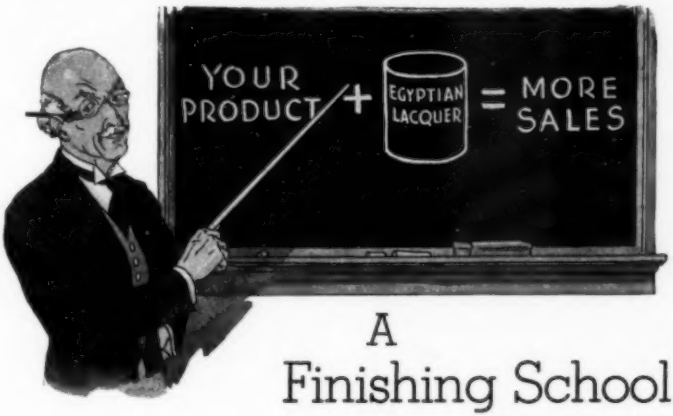
5) Complete uniforming, and highlight with shading lacquer.

6) Spray finish coats.

Method III

1) Spray quick-drying wiping stain on birch and gumwood.

2) Fill walnut or mahogany with quick-drying filler. Wipe wiping stain and filler. Dry two hours.



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Finishing Operation	System "A" Time in Hrs.	System "B" Time in Hrs.	System "C" Time in Hrs.
1. Stain	12	1	0
2. Wash coat	1	0	0
3. Sand	0	0	0
4. Filler	12	2	2
5. One coat of lacquer	1	0	0
Total Hours	26	3	2

Table showing operations and relative time required for each of three different methods or systems of finishing.

System "A"—Water stain, oil filler. Five operations; longest time; one more coat of lacquer.

System "B"—Quick-dry stain, quick-dry filler. Two operations; a quick system.

System "C"—Quick-dry combination filler-stain. One operation; the quickest system.

3) Spray sanding sealer.

4) Sand.

5) Spray shading-lacquer to complete uniforming and highlight.

6) Apply finish coats.

Method IV

1) Spray quick-drying combination filler-stain on birch and gumwood.

2) Fill walnut or mahogany with quick-drying filler. Wipe filler-stain and quick-drying filler. Dry two hours.

3) Spray sanding sealer.

4) Sand.

5) Spray shading-lacquer to complete uniforming and highlighting.

6) Spray finish coats.

Method V

1) Spray quick-drying stain, uniforming and shading in one operation directly on the white wood. Dry one hour.

2) Fill entire cabinet with quick-drying filler. Dry two hours.

3) Spray finish coats.

In the accompanying table I show a comparison of relative times for three methods. It is apparent that the quick-drying combination filler-stain system requires only 7.7% of the time required by the water-stain, oil-filler system.

The use of many new raw materials has given rise to new methods in finishes. The requirements of speed, reduction in number of operations, greater permanency, better adhesion, and elimination of grain and veneer raising are turning more and more manufacturers away from the old oil, water and spirit stains. Quick-drying stains and fillers are becoming increasingly popular and not only are they eliminating many of these old troubles but they are also producing more economical and superior finishes.

Plastics Year Book for 1935

A big reference book containing the latest information and illustrations about modern plastics, well printed on coated paper with stiff cloth binding in red, gold and black —2-in. thick, 718 pages size 6¼x9¼-in. — this is "British Plastics Year Book 1935." It is published by British Plastics & Moulded Products Trader, 19 Ludgate Hill, London E. C. 4, England.

Metallic Zinc Powder Paint Booklet

A 16-page illustrated booklet, 6x9-in. page size, bound in heavy paper covers, has been published and released for distribution by The New Jersey Zinc Sales Co., 160 Front St., New York, N. Y. The contents reveal considerable information about the merits of metallic zinc powder in industrial paints — as a primer and finishing coat for iron, steel and galvanized surfaces . . . where it serves as an excellent rust-preventative coating.

Sanding Curved Surfaces

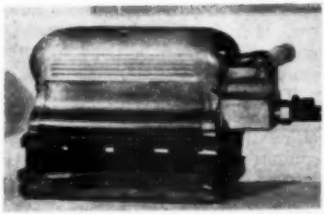
on

Wood, Metal, Marble, or Composition Products

by H. E. Payne, M. E.

CONSIDER any large or medium sized metal products where there are curved or flat surfaces—for example, automobile bodies, electric refrigerator cabinets, steel furniture, gas or electric ranges, machine tools—in fact all metal surfaces requiring conditioning preparatory to receiving lacquer, synthetic enamel or other finishes. The surfaces must be smoothed up nicely and made perfectly clean before finish coats are applied. Usually the final smoothing is done with small sheets of abrasive paper or abrasive cloth — the work being accomplished in some cases by what is termed "dry sanding," and in other cases by "wet sanding."

Formerly all of this sanding was done by hand; some of it is still handled that way. The required flexibility back of the sandpaper or abrasive cloth (to make the pressure even and uniform over all curved surfaces, as well as over flat places) was provided by the palm of the workman's hand—with or without a thin resilient pad interposed between the hand and sandpaper. Naturally, hand sanding is slow and laborious, therefore it is costly. Any attempt to speed up hand sanding is done at the risk of having the work slighted.



Portable, air-driven sander flexibly padded over the stretched sheet of abrasive; has 1¼-in. back-and-forth stroke; weighs 7-lbs.

I have had occasion to check the performance of a flexible-pad mechanical sander, as compared to hand sanding, and what I learned ought to interest every production executive whose responsibility includes the supervision of any sanding or smoothing-up operations on curved metal or wood surfaces preparatory to finishing. This tool (shown in the accompanying illustration) is air-operated, weighs 7-lbs., and the pad works with a reciprocating motion, the stroke of 1¼-in. having the forward and backward motion characteristic of hand sanding. The sanding pad travels back and forth at the rate of 2800 to 3000 strokes per minute, therefore it is much more rapid than hand sanding.

The pad device which carries the abrasive paper is made of rubber, fabric and felt, and is bridged in such a manner as to be fully flexible, hence it is applica-

ble to use on convex or concave surfaces, along mouldings and in places generally considered difficult to sand. Due to its light weight and small size, it can be used on all types of work for long periods without tiring the operator. It is fitted with a water connection so it can be used for wet sanding as well as dry sanding.

To show how the results of mechanical sanding (with the machine illustrated in this article) compare with hand sanding curved surfaces, two classes of work were analyzed.

No. 1—A manufacturer of toilet seats had formerly used hand sanding before and after undercoating, and in preparation of both the seat and the cover for lacquer finishing. The sanding operations checked were as follows:

Sanding the edges and face sides of seats: Actual time required for hand sanding, 9¾ minutes. Actual time required with portable air-driven sander, 5¼ minutes.

Sanding the edges and flat surfaces of the cover: Actual time required for hand sanding, 9¼ minutes. Actual time required with the portable air-driven sander, 4¾ minutes.

Because of its flexible pad, the mechanical sander readily adapted itself to the curved surfaces of the seats and covers.

No. 2—A typical collision refinish job in a custom body shop. Naturally it would be impossible to exactly duplicate this particular condition of the wrecked automobile in question. However, the time estimated for hand sanding represents the judgment of an experienced foreman in charge of refinishing operations.

The detailed specifications for this refinish sanding work were as follows:

Left front fender to be almost entirely refinished.
Lower panel of the rear left door to be refinished.
Left rear fender to be almost entirely refinished.
Back quarter above the left rear fender to be entirely refinished.
Estimated time required for hand sanding, including careful feathering out at edges, 1½ hours.
Actual time required with the portable air-driven sander, 43 minutes.

Another example, same kind of sanding:

Right rear fender, three-quarters to be refinished.
Top radius of body on right side over doors, to be entirely refinished.
Right front fender, one-third to be refinished.
Estimated time required for hand sanding, 2 hours.
Actual time required with the portable air-driven sander, 51 minutes.

Extensive tests have been conducted to determine the adaptability of this mechanical sander to all classes of work. Time study data have proved the machine capable of saving 50% to 80% in time required on spot jobs, and 50% to 60% in time required on line production. These comparisons are in relation to the hand method. . . . The results of these tests show a saving of 10% to 20% in abrasives used.

NOTE: Since writing the above article, I have found that in more recent instances in work connected with metal caskets, Diesel engines, laundry machinery, guitar and mandolin bodies and many other materials, the savings in time and abrasives have been much in excess of the tests indicated herein. In the case of the Diesel engine parts the saving established was over 63%. As to abrasives savings, most of the comparative tests since then show a much higher percentage than herein stated.

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« Cable Lacquers »

by M. H. Corbin
Director, Arco Research Laboratories

An unusual type of lacquer developed to withstand changes in temperature from below zero to 300°F., contact with oil and grease, and at the same time provide good electric insulation, be flame-proof, remain flexible and not crack, peel or disintegrate in severe service.

WITH THE introduction into the automotive industry of high-powered and high-compression motors, it became necessary to secure durable insulation with increased dielectric strength. Work was immediately started in improving the rubber compound used in insulation. Inasmuch as rubber is affected by oils and gasolines and rapidly deteriorates, the problem resolved itself into the development of a protective coating for the rubber to prevent it from coming in contact with greases, oil, etc.

It was at this point that the lacquer industry accepted the task of working out a nitrocellulose coating. The initial attempt was merely a film of the usual type of nitrocellulose lacquer. The introduction of this type of finished cable improved the appearance and durability so much that the cable manufacturers adopted a lacquer finished cable as a standard.

Temperature Changes; Flexibility

Later it was found that the unusual conditions to which these cables were subjected (alternate changes in temperature from the extreme heat of the motor to freezing in cold climates when the motor is not running) caused a rapid breakdown. Constant contact with oils, gasoline, greases, etc., soon caused the film to lose its flexibility and crack. These cracks permitted the oils to seep into the rubber and cause the usual deterioration.

Although the life of the cable was somewhat increased by the use of the lacquer, it was apparent that a greater thickness of film with more permanent flexibility was necessary. This, however, made the problem more complex. The lacquer manufacturer began to search for the proper combination of plasticizers, gums, etc., to meet these requirements. Cable manufacturers started to increase the number of coats of lacquer. To do this economically it was necessary to change methods of application. This progressed very rapidly to such a point that definite specifications were drawn to the effect that the finishing ma-

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terial, when applied to the cable, must stand certain temperatures for a definite period of time without losing its flexibility, must stand a temperature of zero for a certain length of time and remain flexible, and also not lose its flexibility when subjected to motor oils at elevated temperatures.

Flame-proof; 12 to 24 Coats

When these specifications were met by the lacquer manufacturer, they were made more severe with the idea of constantly improving the cable. The development work was going on, continually searching for new ingredients. Flame-proof materials were demanded, higher heats required, more flexible materials requested, until today the cable manufacturer applies anywhere from 12 to 24 coats of lacquer on high-tension cables, obtaining a film thickness of approximately 10 to 12 mils.

The cable of today will stand severe conditions. After being exposed at 300°F. for 12 to 15 hours, the cable can be bent around a ½-in. mandrel without cracking the finish. The cable will stand immersion in hot oil baths or a mixture of oil and kerosene for 40 hours at 220°F. and will still take a ½-in. mandrel bend without cracking. Furthermore, the flame resistance of the finish has been improved to such a point that when the finish is ignited it will extinguish itself.

Electric Insulation

Not only were the physical conditions met by lacquer but the dielectric and corona strength of the insulation was increased many times by a lacquer finish. Lacquer for cable differs materially from the usual type of lacquer formulation. Under normal conditions, nitrocellulose (the chief constituent of lacquer) will decompose at temperatures above 200°F.; also the usual plasticizers that are incorporated into nitrocellulose films will be driven out at these elevated temperatures, or dissolved out of the film when in contact with oil. Paint films in general are very brittle at low temperatures. Off-hand, nitrocellulose, being of a very inflammable nature, would appear to be a hazardous material to use as a finish for ignition cable, but all these apparently impossible conditions have been overcome. Not only are these finishes applied to automotive ignition cables but also for other types of cables, airplanes, boats, radio wires, and many other varied uses.

Cable lacquers today are divided into three main classes:

A—Low Tension.

B—Intermediate.

C—High Tension.

Oil Resistance

The only requirement of low tension cable lacquer is the flexibility on bending at room temperature. The intermediate finishes must be flameproof, that is, when the finish is ignited, it must extinguish itself. It must also stand a mild heat test. The most severe tests are met by the high tension finishes. It must have the flame resistance of the intermediate cable lacquer and also stand a temperature of 300°F. for 12 hours. It must also retain its unusual flexible characteristics as well as stand immersion for 40 hours in a mixture of oil and kerosene at 220°F., and a temperature of zero for 10 hours.

With all these conditions to meet, the method of application

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introduces other complicated conditions in the limited drying time given between coats. The finished cable is rolled on spools and no sticking of wire is permissible.

Continued Development

As the severity of the requirements increased, the cable manufacturers themselves have been constantly improving their insulating compound, method of braiding the cable, etc. By working hand in hand with the lacquer manufacturer, a cable is obtained today which, a few years ago, would have seemed impossible.

However, the cable of today has nowhere reached its maximum goal. Development work in the laboratories of both the cable manufacturer and the lacquer manufacturer is constantly in progress, the object being to try to obtain the same thickness of film more economically and improve the resistance for automotive and airplane work.

A Custom-Built Lacquer

It has been found that certain lacquers will work in combination with certain compounds used for insulation and certain methods of braiding, etc. It has therefore reached a point where cable lacquers have to be "custom-built." Lacquers applied over certain types of cables will meet certain conditions while the same type of lacquer applied over another manufacturer's cable will break down. Therefore, it is readily conceived that it is essential that a lacquer be formulated as a compliment to the compound used in the manufacture of the cable.

In formulating these unusual lacquers the fundamental principle involved is the proper choice and combination of plasticizers and nitrocellulose. The exact proportions have a definite bearing on the resultant finish.

Methods of Application

Inasmuch as the general methods of application are similar, each manufacturer has developed within his plant variations in applying the finish on the cable. Broadly speaking, the usual method is to run the cable continuously through a small bath of cable lacquer and as the cable is drawn through the lacquer it is squeegeed on the cable. It is then carried into the towers where the lacquer is dried.

Each manufacturer has his own development as to the type of squeegee used, temperature and length of towers, and general methods of handling. No two manufacturers use the same compound for cable insulation or the same type of braids. All such factors enter in producing a better cable.

Bruce C. Dodd & Co. Naphtha Research

Bruce C. Dodd announces that he is opening a Technical Research Laboratory which will serve both the petroleum refiner and the user of industrial petroleum naphthas. He plans to supply a complete consulting service in a field which has to date been subject to very little research activity. There is no consulting firm at present serving this phase of the petroleum industry exclusively. Further Mr. Dodd advises that the service in order to be most beneficial, must not only cover chemical research but also technical sales application.

Until March 1st, Mr. Dodd was Eastern Division Manager for the Anderson Prichard Oil Corporation, nationally known for their fine work on industrial naphthas. Their operations for many years were under the direction of Mr. Dodd from Chicago to the Atlantic Seaboard and Canada. He will be located at Akron, Ohio . . . his mailing address being First Central Trust Bldg.

BINKS *THOR* Model 2

PRECISION! BALANCE! CONTROL!

Specified where
FINISH Really Counts

Thor Model 2 Guns Ordered:

General Motors	....over	4,000
Chrysler	..... "	3,050
Studebaker	..... "	1,500
Briggs Body	..... "	2,000
Fisher Body	..... "	1,200

When you buy the Thor Model 2 you get your choice of over 10 different nozzle "set ups." You get a chart showing just the best nozzle for the type of material you spray at the air pressure you have. Perhaps this is why so many are turning to Binks. Investigate!

If FINISH counts on your product the New Binks Thor Model 2 is the gun for you. A special nozzle to suit your needs can be recommended. Send today for Binks new complete Spray Equipment Catalog.

BINKS MANUFACTURING CO.

3105-50 CARROLL AVENUE CHICAGO, ILLINOIS

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Kindly mention INDUSTRIAL FINISHING when writing advertisers

What's New « «

"DuPrene"— Synthetic Rubber

"DuPrene," the trade-marked name for a synthetic rubber made by E. I. du Pont de Nemours & Co., Inc., resembles natural rubber in strength, toughness and elasticity but differs from natural rubber in that it can be vulcanized by the application of heat alone, no sulfur being required. Vulcanized DuPrene is more resistant to oxidation than natural rubber and suffers less deterioration in the presence of oils. It also withstands the action of sunlight better than natural rubber. It is used in preference to natural rubber wherever conditions of service call for a rubber-like material that is more stable than the natural product. The physical properties of DuPrene can be varied over a wide range by incorporating into it carbon-black and other common rubber compounding ingredients.

DuPrene is made by the polymerization of chloroprene (chloro-2-butadiene-1, 3) which is a colorless water-white liquid that boils at 140°F. This chemical and the processes of making it and converting it to synthetic rubber were discovered in the du Pont Laboratories at Wilmington, Del. The primary raw material for its manufacture is vinylacetylene, which is made from acetylene gas by a process discovered by Dr. J. A. Nieuwland of the University of Notre Dame.

Non-Poisonous Color Enamel Is Stain-proof

A one-coat, non-poisonous color enamel that is fadeproof and stain-proof, and which dries in 30 minutes, is announced by the Advance Paint Co., Indianapolis, Ind. This new finish, called "Advance Hour-Coat," is manufactured under a secret process . . . . is available in colors only. Reduction may be made, according to the covering desired, by the addition of 15% to 25% of regular naphtha or mineral spirits. No special thinners are necessary. It is made to spray or dip; works best on wood surfaces. For one-coat work on cheap pieces, it can be sprayed on bare wood. For quality work, it should be applied over a sealer or undercoat.

Advance Hour-Coat is fadeproof and waterproof. It dries to handle in 30 minutes and ready to ship in four hours. While this material is adaptable to general use, it is particularly suited to juvenile furniture and toys, being non-poisonous and impervious to acid stains, including uric acid.

Binks Flow Gun

The Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., has perfected a new style flow gun to meet the demands for a gun to flow on stripes of paint, rubber cement, or other materials. The new unit is known as the Binks No. 11 gun and is designed especially for flowing sealing compounds on automobile body tops, striping auto bumpers, and flowing cements and other plastic materials.

For flowing on single or multiple stripes of paint, cement or plastic material.

Material is forced out of the nozzle directly onto the work. As shown

WALKER CALLS THE ROLL

Of Products developed by Walker Chemists that are widely used and accepted by leading manufacturers as the standard of quality and excellence.

- **LACQUER ENAMELS** for Venetian Blinds—in attractive colors.
- **METAL LACQUERS**—For all purposes—inside and outside exposure.
- **ONE-COAT HIGH GLOSS LACQUER ENAMELS.** Have exceptional adhesive properties, applied direct on metal without a primer.
- **INDUSTRIAL SYNTHETIC ENAMELS.** Excellent coverage—high and low bake, air-dry.
- **CRYSTALLIZING LACQUERS**—For a wide variety of decorative effects.
- **METALLIC PYROXYLIN ENAMELS**—A one-coat lustrous finish in gun metal, gold, silver, brass, bronze, copper and various pastel shades.
- **AUTOMOTIVE FINISHES**—Pyroxylin or synthetic. Crystalcote synthetic enamels are standard on the largest individual fleet of busses in the United States.
- **CHROME RACK ENAMEL**—An acid and alkali resisting coating.
- **CABLE AND COIL LACQUERS.**
- **SPECIALIZED FINISHES**—For rubber, textiles, glass and composition materials.

A sample of your product finished by Walker or a finished sample panel will be sent on request.

H. V. WALKER CO.

ELIZABETH, NEW JERSEY

in the illustration, special nozzles are furnished and are used according to the type of work. Other nozzles can be built according to the specifications of the user to flow on any width of stripe up to 1-in. wide. The multiple nozzles shown flow parallel stripes.

The No. 11 gun is small, light and handy, and its full grip and four-finger trigger is especially suited to the striping operation.

"Colorimeter" Checks Color Variations

Colorimeter is a scientifically designed instrument which accurately matches or compares colors, registering variations indiscernible to the human eye. It provides a color check heretofore impossible; enables you to determine the matching of shades to a degree far beyond present day commercial requirements.

Wherever color is a consideration, there is need for a Colorimeter. Everyone using paints, lacquers or other finishes in any form will welcome this new method of exact color matching.

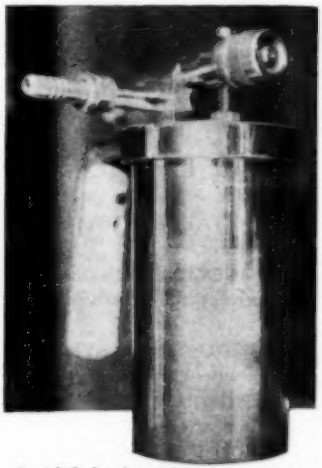
Colorimeter is light and compact—easily carried in the hand. It operates from any 110 to 115-volt light socket, at negligible cost.

To make color comparison, simply place the instrument over the surface of the proper color, press the switch, note the reading; then do the same on the color to be matched. Comparison of the readings indicates the existing discrepancy to the millionth degree.

Colorimeter is entirely unaffected by outside light sources, furnishing its own illumination from within. Day or night, regardless of external light, you can depend upon uniformity and accurate comparison from Colorimeter. In fact it can "see" ultra-violet and infra-red rays, both invisible to the human eye.—M-R-H Laboratories, Dowagiac, Mich.

Hommel Spray Gun

The first small sprayer, with cup attached and without a needle, to have a flat spray is featured in the "Duquesne" flat spray machine manufactured by the O. Hommel Co., 209



A nickel-plated, solid-brass spray gun.

Fourth Ave., Pittsburgh, Pa. A specially designed nozzle flattens out the spray, enabling it to cover large areas evenly and in much less time than with the ordinary "round spray."

The "Duquesne" flat sprayer is a popular model, combining the best features of two other Hommel machines. It features the short-nosed nozzle of the "Bull-Dog" and its sturdy construction, with the comfortable pistol grip of the "Keystone" . . . . is designed to handle heavy liquids such as lacquers, enamels, glazes, bronzes and like materials, and for covering large surfaces quickly it is ideal . . . is made of solid brass, heavily nickel-plated and has no soldered joints. It is perfectly made and is finished like all Hommel air brushes with coupling at

VALUE *above* COST!

NOT by magic, but by using accepted standards as your "yard stick," you will find it possible to produce a *better* finish at no additional cost, with our "Unquestionable Quality"—Custom-Built finishes.

Lacquers, Sealers, Stains, Fillers, etc. Liberal working samples to convince you — write for them.

V. J. DOLAN & COMPANY, Inc.

Manufacturers of "Unquestionable Quality"
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Dipping?

Yes! In many industries unexpected economy and satisfactory finish have been secured by using Dipping Cel-u-Lak. Difficult sizes and contours have been successfully handled.

Toys, auto moldings, agricultural implements, tools, novelties, handles, brushes, are only a few of the objects where Dipping Cel-u-Lak has been effective.

Send us a dimension sketch of the article; tell us the material and the color desired and we shall give our suggestions gladly.

THE VARNISH PRODUCTS CO.

CLEVELAND, OHIO

the hose end so that the machine can be detached and attached to a hose at any part of the shop in a few seconds, without loss of time.

The regulator on top of supply tube accurately controls the volume of fluid desired for spraying. The adjustment is simple; once set, the flow of material will remain constant and even and will require no further adjustment until some other size spray is wanted. By removing the regulator, the reservoir can easily be cleaned of any material which may have become hard.

Banbo Black

"Banbo Black" is a non-bleeding, non-settling, low-viscosity liquid black which air dries dust and tack free in from three to five minutes, yielding a rich black, semi-gloss finish. One gallon covers over 550-sq. ft. of a bright, shiny surface. It dries more rapidly than a nitrocellulose base (lacquer material), even though the residual film deposited by one spray coat is approximately two to three times as thick as a regular lacquer material . . . . no danger from runs or sags on vertical surfaces, even under the most severe production speeds and handling. Can be baked one hour at 250°F. to a very high gloss.

This material requires no reduction unless it is exposed to the air for a considerable length of time, as in dip tanks, which permits solvent evaporation. In case solvent evaporation does occur the material can be readily adjusted by replacement with small amounts of coal tar solvents.

Extremely good adhesion to bare metals is a characteristic of this material. It adheres to brass, steel, nickel, tin plate, galvaneal, Parkerized metal aluminum, aluminum alloy, wood, composition board, etc. The finish is extremely resistant to gasolines, motor oils and gasoline fumes. A product of The Arco Co., Cleveland, Ohio.

Air Filter

A new design for an air filter has recently appeared on the market which makes use of a new principle in the separation of water, oil and other foreign materials from compressed air.

It is the combination of the centrifugal separator and the diffusion through a highly porous filter medium which retains its pore shape even though completely saturated. Air enters through an orifice located on the upper rim of the shell and circles around the inner rim at high velocity, throwing out the oil, water and other liquid entrainment into vertical slots by certrifugal force. As the air slows down in velocity, it approaches the center axis and passes through the walls of a highly porus filter stone molded in the shape of a tube closed at one end. The open lower end of this tube is mounted on a hollow pedestal, allowing the filtered air to pass downward and out the exit. The filter tube is a recent development composed of aluminum oxide crystals mixed with a ceramic

Cleans compressed air for paint-spraying, sandblasting, etc. Notice the porous filter medium at lower left.

New . . .

Hi-Speed KROMFLEX PRIMER

Air Dry and Baking

"*Industrial Finishes of Quality*"

Adheres perfectly on any smooth ferrous or non-ferrous metal and is permanently flexible under either Lacquer or Synthetic Enamels.

An excellent air dry primer for thin gauge metal where baking might cause trouble in warping.

Adapted to quick finishing schedules in Auto Repairing Shops where in emergencies it can be coated with Lacquer in a few minutes without danger of "lifting."

Will bake as high as 350 degrees Fahrenheit.

Has exceptional anti-corrosive properties and remarkable durability. Salt Spray and Humidity do not affect it. *Made by*

Indianapolis *Paint & Color Co.*

Indianapolis, Indiana

Paasche Convertible All-Purpose Airbrushes!

ABOVE — Paasche airbrush used with pressure tank.
LEFT—Used with gravity cup.
RIGHT — Used with syphon cup.

Industrial finishers are finding the new Paasche Airbrushes faster, give smoother coverage, and are unmatched for durability. Perfect balance and effortless trigger make Paasche Airbrushes the easiest handled airbrushes on the market. . . . No loss of materials —no clogging—rapidly changed from one color to another—the only Standard Convertible Universal Airfinishing Tool Made. Write today for new Bulletin A1-35, which illustrates and describes this equipment.

Paasche Airbrush Co. 1917 DIVERSEY PARKWAY CHICAGO, ILLINOIS

bond and molded into the tube shape. It is vitrified in an oven at high temperature, with the resultant porosity of 38% of its total volume. The filter tube so thoroughly diffuses the air in passing through its porous structure that oil or water comes in intimate contact with the walls of the pore and is absorbed up to the saturation point.

A spare filter tube is furnished with each unit for replacement once in ten days or two weeks. The removed stone is cleaned in any oil solvent and dried for the next replacement. The life of the filter tube is infinite, as the cleansing process restores its full absorbent properties.

These new filters are manufactured by the R. P. Adams Co., 220 Delaware Ave., Buffalo, N. Y.

Steel Wool Pads

A new product in steelwool for smoothing, cleaning and rubbing is called "Bak-Bone Pads." This is an exclusive development offered by the American Steel Wool Co., . . . a most important advance in steelwool . . . steelwool pads with a "back-bone" . . . "the sandpaper block idea applied to steelwool."

The "back-bone" is a piece of special fiber board, 3⅝x4½-in., around which a ribbon of steelwool is wrapped. This gives firmness and

backing to the steelwool, greatly increasing the efficiency. The "back-bone" keeps the steelwool flat for flat surfaces, and distributes pressure from the hand evenly, so that there are no streaks from fingers pressing through the wool. The faster cutting speed and superior abrasive power is quickly apparent in use.

The ribbon of steelwool can be unwound, folded and refolded, making possible many fresh abrasive surfaces, without tangling in the process. Even the last fold is usable, because of the firm backing supplied by the "back-bone." This new product is supplied in the regular grades of steelwool, No. 3, 2, 1, 0 and 00.

There are 16 large Bak-Bone Pads in each package.

Recover Old Solvents

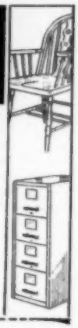
If you use solvents for cleaning metal parts preparatory to finishing, or for cleaning spray guns, containers, or other equipment, you can restore them to their original state of cleanliness and purity by putting them through a solvent recovery still. Stills for this purpose are manufactured by the Barnstead Still & Sterilizer Co., Inc., 6 Lanesville Terrace, Forest Hills, Boston, Mass.

The operation of a Barnstead solvent still is simplicity itself. A batch of used solvent is fed to the evaporator. There it is brought to the boiling point by heat from the steam coils (stills can also be furnished for either gas or electric heating). Distillation sends the pure, clean solvent vapors up around the baffle and through the vapor pipe into the condenser. The baffle prevents splash and entrained liquid from going up with the dry vapor. Any condensate forming in the vapor pipe drops back through the central drain of the baffle, clear of the rising vapor.

In the condenser tubes, the vapor is condensed into distilled pure solvent which passes out through the auxiliary cooler and is ready for use again. The dirt, oil, grease and foreign matter remain in the evaporator and may be flushed out at the end of the cycle and the process repeated. These stills are simple to operate

LARCOLOID

DURABILITY *plus* Speed!



Air-dries dust-free in a few minutes. Dry to handle in approximately one hour.

BAKING TYPE—Formulated to your production set up. Will bake at any temperature you specify.

BEAUTY—An ideal porcelain-like surface having excellent adhesion and resistance to acids, alkali, hot oils, salt spray, etc.

MONEY SAVING—Good reduction and opacity. No primer or bond coat necessary.

SEND FOR FREE SAMPLE→

Larkin Co Inc. Buffalo, N. Y.
Name_____
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Attention of _____
☐ Air-Dry.
☐ Bake. Temp._____ Time_____

Larkin Co Inc. PAINT DIV., Buffalo, N. Y.
Manufacturers of Primers, Enamels, Varnishes, and Japans

SPRACO PRODUCTS

Moisture in the air supply is responsible for a great many finish defects.

The Spraco Model 88 condensing type oil and water extractor, as illustrated, will absolutely eliminate this difficulty, increasing production, reducing rejection losses and insuring the highest quality of finish.

Equipped with the latest model automatic drain valve these units are remarkably easy to install and require no attention.

Write for Bulletin No. I-160

Spray Engineering Company
INDUSTRIAL FINISHING ENGINEERS
116 Central Street Somerville, Mass.

ALUMINUM VEHICLES

for SPECIAL INDUSTRIAL DIPPING and BAKING APPLICATIONS

THOMPSON Aluminum Vehicles for these special applications are, of course, custom tailored to individual requirements. If you have such a problem we will be glad to put our special knowledge in this field at your disposal.

THOMPSON & COMPANY
Since 1847

Industrial and Technical Paints, Enamels and Varnishes

P. O. Box 557 N. S. Pittsburgh, Pa.

MAGNUS CLEANERS
upset a 20-year-old "institution"!

For over 20 years, a large eastern manufacturer had used caustic soda cleaning steel before plating. So long had it been used there, that, as the plating foreman put it—it was an "institution" with them!

But now, MAGNUS CLEANER No. 93-R is doing an excellent job there on that job, and the caustic, with its dangerous fumes and burns, is no more.

The safety factor is a prime reason why many users turn to MAGNUS MATERIALS. They insure safety, producing better results with milder and safer materials.

Our Field Representative in your vicinity will gladly call and demonstrate under your own plant conditions. Write today for address.

Magnus Chemical Co.
40 South Avenue Garwood, N. J.

Magnus
CHEMICAL COMPANY

and easy to clean. Impurities that have been removed by distillation can readily be flushed from the evaporator. The interior of the evaporator is easily accessible by removing the top. Likewise, steam coils or electric heating elements may be quickly removed.

Brush Jacket Preserves Brushes

Culminating three years of research and redesigning, the Pittsburgh Plate Glass Co. has been awarded first prize—a gold medal—

Won first prize as a package.

by the Modern Package contest board for the jacket which encloses their popular Gold Stripe brush. The jacket, made of a special fiber which is impervious to linseed oil, turpentine, water, etc., preserves the bristles while the brush is not in use and maintains the shape of the brush throughout its life.

The newly designed covering is simple in detail, but attractive in appearance. Art work consists simply of a narrow gold stripe running

diagonally across the face of the black jacket; in the center, forming a circle, are the words "A Gold Stripe Brush." The back flap contains a message of instruction to the user, also printed in gold. When open, the jacket forms a perfect receptacle for the brush by simply placing the bristles flush with the inner surface of the fiber. The back flap is then folded over and securely fastened with a string and sealing button provided for the purpose.

"Kelsanite"—Rubber Protective Coating

Rubber as a low cost protective coating during handling, storage, or shipment of manufactured articles is the latest development in the battle against corrosion, deterioration and damage in handling.

Developed as the result of several years' research under the direction of one of the country's outstanding rubber chemists, a new material to be marketed under the name of "Kelsanite" is to be announced shortly by a Michigan company.

Kelsanite is a non-inflammable liquid containing latex, it is reported, which can be applied to any material by brushing, spraying or dipping, but which turns into live rubber in a few minutes after application to any surface.

While Kelsanite has high adhesive qualities it does not vulcanize onto the surface to which it is applied, the report says. As a result it is as readily removable as a cellophane wrapper when the protective coating has performed its function.

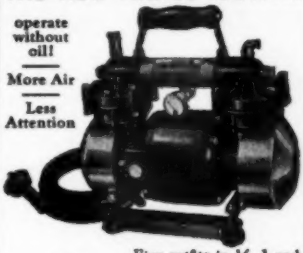
Kelsanite, which is to be made available in several viscosities and compositions, to best suit specific needs, contains no material, it is said, which could injure the most finely finished surface. Furthermore, since rubber is insoluble and is as waterproof and air tight as any material known, it should provide complete protection against the action of any known element.

THE NEW AIRFLO OUTFITS

operate without oil!

More Air

Less Attention



Five outfits in ¼, ⅓ and ½ H.P. sizes . . each one expressly designed to give you exactly what you want in equipment.

The New No. 17 Crown Gun—A splendid finishing gun, with high-priced features . . at low cost. Write for full details on this new equipment.

CROWN SPRAY GUN MFG. CO.
1218 Venice Blvd. Los Angeles, Calif.

CREATIVE SALES SERVICE

SOMETHING MORE THAN JUST A FINISH

Our Art Department Supplies . . . Suggestions . . . Original Ideas . . . Art for Decalcomanias . . . Stencils

WRITE

BENJAMIN FRANKLIN PAINT & VARNISH CO.

Crack Filler Softens Under Lacquer

Do you have any information on a putty or crack filler that will not soften under a lacquer sealer? We are having trouble with our present material softening and dissolving when we spray on our sealer. If you could give any information on this problem it would be highly appreciated.—C. G. H.

We manufacture a crack filler powder which does not soften or shrink under lacquer sealer. This powder is supplied in natural, mahogany and walnut colors; is easily mixed with water to make a paste of proper consistency for use; dries in a few minutes and is thoroughly hard in an hour; can be mixed and colored with acid stain in the right proportions to make an easily workable paste, and it may be stained over and will not show through. This is made possible by the absorption of the stain by the filler. Water stains, penetrating stains, or spirit stains may be used over this crack filler because the stain will penetrate into the filler and be absorbed by it . . . .—The Gilbert Spruance Co.

We have two products which are excellent for use under lacquer, where an oil putty or wax filler is undesirable, and believe that either of these will fill your requirements. These products are Savogran crack filler and Savogran wood putty; they are practically alike, the only difference being that the wood putty is more easily worked with tools after it has hardened. Both these products are supplied in powder form and are made ready for use by mixing with water to a plastic consistency. They set in about 35 minutes and can be finished with lacquer, paint, varnish or stain. . . .—The Savogran Co.

San-Itai-Rie filler will not soften up, nor is it affected in any way by any finishing materials with the exception of water stain. Being soluble in water, it has a tendency to soften up when used in conjunction with water stain. It is supplied in several colors.—San-Itai-Rie Filler Co.

As far as we know our material will stand up under a lacquer sealer.—The Las-Stik Mfg. Co.

Questions « Answers

Protects Light-Colored Shoes in Process

In reference to the second inquiry on page 6 of April INDUSTRIAL FINISHING, wherein a company in England asked for a material to spray on light-colored shoes to preserve the shoes from being soiled while in process of manufacture . . . ., it so happens that we have formulated a material for exactly this purpose and are at the present time supplying it to a large number of shoe and riding boot manufacturers in both this country and abroad. We call it "Superflex Leather Clear No. 20914"— clear, transparent, lac-

quer-base material for use on leather; possesses extreme flexibility and unusual adhesion; will not scratch white or show white upon continued creasing, and is extremely long in life; dries rapidly, drying to a wax-like gloss; requires thinning with Lacquer Thinner No. 1665, in about equal parts for spray application.

It might be well to mention, at this time, that we have been producing this formula for over five years and that because of the success we have had with this particular formulation, we have not adjusted it in any degree. . . .—C. W. Haynes Laboratories, Inc.

Tack Rags

We have been looking through your INDUSTRIAL FINISHING magazine for information on tack rags, but haven't found any. Perhaps you can tell us where we might purchase these tack rags, or how we could make them.—B. Paint & Varnish Co.

To prepare a tack rag, use closely woven material, such as that from which sugar sacks are made. This cloth will be more suitable — that is, more lint-free and cleaner and softer—if it is first soaked and washed thoroughly in boiling water. I prefer this to cheesecloth.

Spread the prepared cloth out flat and spray a thin coat of regular "tack-rag" varnish on it; pick it up and wring out any excess varnish by twisting it as you would wring water from a rag. Now flatten it out and carefully fold it into smooth flat folds until it is a convenient size to handle. If the rag is used all day it will be necessary to respray it for

MARVELOUS NEW PAINT SPRAY GUN

Handles all types paint, lacquer, etc., especially the new synthetic enamels. Lighter in weight, widest spray, perfect atomization; air purifiers, 5 and 10 gallon pressure outfits, accessories, etc.

Write for Catalog.

The Alexander Milburn Company 1402 W. Baltimore St. Baltimore - Maryland

The ideal fan for speeding up drying of parts or articles in process, accelerating ventilation in certain areas, and similar purposes. Motored fan can be tilted to direct draft upward, downward or straight outward on a level . . . Operates from electric light socket and is furnished with vapor-proof or enclosed type motor, as desired. Propellor blade is nickel alloy aluminum. Height 46-in., weight 70-lbs., floor space 38-in. triangular. Price very reasonable.

Send for price, descriptive circular or for any additional information desired

UNIVERSAL MFG. CO.

324 W. 10th St. Indianapolis, Ind.

STANDARDS OF THE INDUSTRY

PERMACEL The *standard* paper masking tape . . . sticks in all weathers . . . razor-sharp edges.
JONFLEX The *standard* light, fine-woven cloth tape . . . sticks in all weathers . . . razor-sharp edges.
INDUSTRIAL The *standard* heavy, coarse-woven cloth tape . . . sticks in all weathers . . . razor-sharp edges.

Send for samples. Sizes ¼" to 36" wide in 60-yd. rolls.

THE REVOLITE CORP.
A Subsidiary of Johnson & Johnson
NEW BRUNSWICK, NEW JERSEY

1617

Clear Metal Lacquer

No finish can be finer than its protective lacquer coating. And so we urge the use of 1617.
A BETTER metal lacquer, especially developed to protect and preserve finish on fine hardware—things of brass, copper or bronze.
You'll find it economical and amazingly durable. It prevents "spotting out."

THE STANLEY CHEMICAL COMPANY
East Berlin, Conn.
Lacquers—Synthetics—Enamels—Japans
A subsidiary of
The Stanley Works, New Britain, Conn.

service next day. To prevent the rag from drying out while not in service, place it with a water-wet sponge in a can or pail that can be covered with a tight-fitting lid.

Cheap varnish does not make the best tack rag, as it dries out too rapidly and does not pick up the loose lint as well as the regular "tack-rag" varnish. Several manufacturers are in position to supply tack-rag varnish.—T. R. Nall.

Letters from I. F. Readers

(Continued from page 6)

finish of 80% to 90% of this work is a black nickel, and successful application of this finish, thus far, has been possible only when the steel is either copper plated or brass plated, and the black nickel finish followed by a lacquer coating to prevent abrasion.

Some time back one of your advertisers put on the market aluminum alloy sheets prefinished in various colors. I was fortunate enough to obtain samples together with their description of the application of these materials, pointing out that this material might be processed through punch presses and then subjected to comparatively deep drawing operations without destruction of the finish on the sheet material.

Can you give me any information as to development work along these lines, as applied to steel, and refer me to firms who might be in position to supply the material, or tell me where I might obtain this information? I will appreciate greatly your efforts along this line.—F. S. C. (Industrial Engineer).

Ferbert-Schorndorfer's Cincinnati Representative Dies

Shed R. Johns, 39, Cincinnati representative of The Ferbert-Schorndorfer Co., Cleveland, Ohio, fell dead after completing a golf game on a Cincinnati course Thursday, April 4, 1935. Mr. Johns lived in Cleveland for several years before he went to Cincinnati nine years ago.

Mr. Johns was an athletic star at Dennison University and later played professional baseball with the Philadelphia Athletics and football with Akron and Cleveland teams. He was a World War veteran. He is survived by his wife and one child. Funeral services were held at Newark, Ohio.

Industrial FINISHING

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment

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EDITORIAL

What Colors Will be Popular this Fall

"Rustiques," a group of deep cloudy pastels and rich Autumn tones, represent an important fashion motif in the collection of 48 Fall Woolen Colors just released in new confidential brochure form by the Textile Color Card Association to its members. The "rustic" tones comprise Goldmist, Ashen Rose, Blucloud, Woodlilac, Helio Blue, Grapetone, Meadow Rose, Harvest Green, Autumn Sun, Rustic Red, Mistblu and Heather Green. They are particularly distinctive for their smart combining qualities with darker basic shades, especially browns and vintage tones.

The brilliant "Touchdown Colors," which contribute another highly interesting theme, comprise Victory Blue, Varsity Gold, Spinner Red, Rally Green, Pennant Purple and All-Star Blue.

The gay, sparkling "Ski" colors highlight Tyrol Violet, Alpine Rust, Norway Red, Savoy Rose, Bavaria Green and Engadine Blue.

Basic colors in this Fall woolen collection reveal highly important new developments. In the red series, Oriental Oxblood represents an important note both as a basic and accent color, principally with blues and greys. Tuscan Wine and Dregs of Wine are deep vintage tones of special style significance. They are the smart Fall expression of the present vogue for pink and rose tones. These mellowed wine shades are particularly chic when combined with deep, misty pastels in the group of "Rustiques," as Blucloud, Ashen Rose and Helio Blue.

Browns maintain their strong fashion position for Fall in entirely new developments. Gingertone, a piquant golden brown, has high style prestige, especially in combination with Ambertan, the newest variation of the fashionable amber range stressed here and in Paris.

The warm reddish note in brown remains extremely important and finds a smart exponent in the spicy Chili Brown. Indo Brown and Manoa Brown are deeper, more neutral tones included in this popular family. A lighter version is found in Branbrown. The beige tones are inter-

preted in Sandpiper, a medium neutral shade and in the deeper Caribou of greyish cast. New variations on the popular rust theme are Copperwood and Pottery Rust. They combine effectively with cloudy blues, especially those with a violet cast.

The green range reaffirms its place in the Fall fashion forecast in smart renditions as Kent Green, a clear true green, bluer tonalities like Adengreen and Amulet Green and the tart yellowish shade called Chivegreen.

Because of its immense popularity this Spring, navy will again be represented in the early Fall mode, though to a much more limited degree. Raven Blue, a deep tone approaching midnight, is a high style version, while Squadron Blue is a lighter shade with a slight purplish cast. The new Fall greys are partial to bluish tonalities, as suggested in the names Nickel Grey and Slate Grey. Taupedust and Ashtaupe also fall in this neutral range.

Exhaust Spray Booths

Wherever spray finishing or spray painting is performed, suction exhaust booths of suitable size, design and construction should be installed. They are needed in the interests of safety, cleanliness and convenience. Booths are available in sizes from the small bench outfit having a 2x3-ft. opening, to large canopy installations for use where railroad coaches are painted. Portable booths, baffle-plate booths, water spray booths and various other types can be obtained to meet practically any requirement or condition.

Spray booth installations, however, must conform to the strict regulations of your state and the company in which you carry fire insurance. These regulations, of course, are for your own protection, as is also the insistence of fire inspectors that booths be cleaned frequently. It is important for users of spray booths to familiarize themselves with all fire regulations so they can comply

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with what is demanded, and so they will know how to avoid being heavily penalized with high insurance premiums for an unnecessarily hazardous condition.

Clean Surfaces Are Still Necessary Before Finishing

Notwithstanding all the progress that has been made in the development of improved finishing materials and equipment, clean, dry surfaces are still necessary before foundation coats can be applied with assurance that they will adhere firmly, dry satisfactorily and provide enduring support for succeeding coats. Proper cleaning is a real problem. It calls for time, labor, material and equipment, all of which cost money.

Among the several kinds of surfaces over which coatings are applied—such as wood, metal, composition material, fabric, leather, rubber, glass and clay products—metal probably presents the greatest problem. Manufacturing processes and exposure to the air generally put most metal surfaces in such condition that strong wet chemical cleaning, followed by rinsing and drying, or strenuous dry mechanical cleaning such as sandblasting, wire-brushing or rubbing with an abrasive, followed by wiping or air blowing, are necessary before the first coat of finish can be safely applied.

Any failure of the finish on metal usually prompts an investigation of the metal cleaning process first, and frequently here is where the trouble is located. The logical program in all metal fin-

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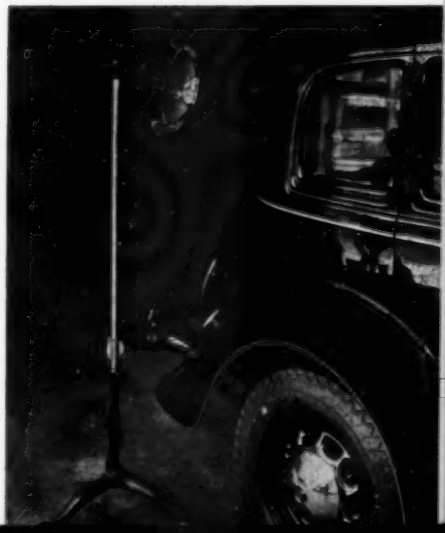

Illustration shows HEATER adjusted to bake upper back

ishing, therefore, is for the management to insist upon repeated inspection of everything that has to do with the metal cleaning process, the idea being to prevent any laxity in the established correct routine. See that nothing short of perfect cleaning gets by —and see that whatever is necessary to accomplish this is provided at all times. Poor cleaning can be and often is covered up temporarily with finishing coats, but this slighting of the work is sure to result in some very costly trouble later — trouble that may be hard to locate and which may include rejected goods returned to be stripped to the metal and refinished.

Lawn Furniture Venetian Blinds

Our New York correspondent reports that the demand for porch and lawn furniture, according to producers, will be even greater this year than last, and they insist that the market will stand an upturn of 5% in prices. The New York City retail market is now showing this line of furniture to a considerable extent. One of the leading department stores recently used a large window to display this type of furniture. Rattan, painted in a dull flat white, with gay colored upholstery, natural varnished willow, or natural lacquer-finished rattan, and in some lines small amounts of black with the white—these were the oustanding colors and finishes. Many of the pieces are in fashionable streamlined designs.

Venetian blinds are having a decided vogue. In one instance the blinds were made of basswood [the wood generally used] with two coats of lacquer, which is considered superior to the older style enamel finish. The colors were cream, green or white . . . The color finishes are sunfast, and the slats will not warp.

Modern furniture is said to have attained a simplicity that makes it dependent on color, design and decoration for effect—and this is amply shown in the New York market.

Wood Stain-Preservative

The advantages of Avenarius Carbolineum as a lasting stain and wood preservative are described in a new pamphlet just issued by the Carbolineum Wood Preserving Co., 628 W. Highland Ave., Milwaukee, Wis. The preparation gives a rustic nut-brown stain to wood, being applied like paint. Dipping is not necessary. In addition to beautifying lumber, shingles and frames its wood preserving qualities are said to double the life of the wood, and prevent destruction by tunneling termites. The preparation is not a creosote oil but contains anthracene oil and other ingredients. Avenarius Carbolineum has been on the market since 1876, being manufactured under the formula of the late Dr. Richard Avenarius.

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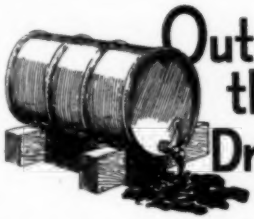

Out of the Drum

APPLYING pitch to the insides of drums or barrels is now an easy automatic operation with mechanical aparatus offered by one of the spray equipment manufacturers.

• • •

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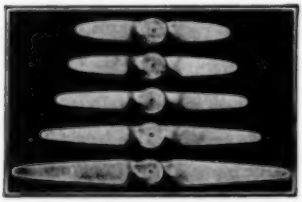

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